A 4

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Honorable Assistant Commissioner
of Patents
Washington, D.C. 20231

Prior Application Art Unit: 2609

Examiner: Lao, L

Sir:

This is a request for filing a Continuation Application under 37 C.F.R. § 1.60 of pending prior application Serial No. 08/288,882 filed 08/10/94 , which is set to issue 09/16/97, of Richard J. Ditzik for Desktop Computer with Adjustable Flat Panel Screen.

1. X Enclosed are true copies of the parent application, file wrapper CIP Preliminary Amendment, oath or declaration of the last application and drawings, if any, as originally filed. I hereby verify that the attached papers are a true copies of the parent application of Serial No. 08/084,011 as originally filed on 06/29/93 , the file wrapper CIP Preliminary Amendment of 08/288,882 mailed 08/10/94, and the declaration filed 08/10/94.

2. ___ A verified statement claiming small entity status ___ is enclosed or X is on file in the prior application and such status is still proper and desired (37 C.F.R. § 1.28(a)).

3. X Cancel in this application original claims 2 - 21 (as renumbered) of the prior application before calculation the filing fee. At least one original independent claim is retained for filling purposes.

4. X A Preliminary Amendment is enclosed. The claims have been numbered consecutively beginning with the number following the highest numbered original claim in the prior application.

5. X The filing fee is calculated below:

Claims As Filed Less Any Claims Canceled In Paragraph 3

For	Number Filed	Number Extra	Rate	Small Entity Fee: $385.00
Total Claims	8 - 20 =	0	X $22 =	0
Independent Claims	3 - 3 =	0	X $40 =	0
		Total Extra:		
			Total:	$385.00

6. _X_ Amend the specification by inserting before the first line, the following

-- This is a continuation application of Serial No. 08/288,882 , filed 08/10/94 now U.S. Patent No. 5,668,570, issued 09/16/97, which was a CIP of Ser. 08/084,011 , filed 06/29/93. --

7. __ Transfer the drawing from the prior application to this application and abandon the prior application as of the filing date accorded this application. An additional copy of the sheet is enclosed for filling in the prior application file.

8. _X_ New formal drawings _X_ are enclosed or ___ will be submitted at a later date.

9. ___ The prior application is assigned of record to:

10. ___ Priority of Application Serial No. _____, filed on ____ in _____ is claimed under 35 U.S.C. § 119. A certified copy __ is enclosed or __ is on file in the prior application.

11. _X_ Please address all correspondence to:

Richard J. Ditzik
3143 Carnegie Court
San Diego, CA 92122

Sincerely,

Richard J. Ditzik

Richard J. Ditzik
Application Pro Se

Date: 9-13-97

(619) 661-2252

cnt-apl.sam

In the United States Patent and Trademark Office

Serial Number: 08/084,011

Serial Filed: 06-29-93

Applicant(s): Richard J. Ditzik

Appn. Title: DESKTOP COMPUTER WITH ADJUSTABLE FLAT PANEL SCREEN

Examiner/GAU: _____

Mailed: 8-8-94

At: San Diego, CA

Supplemental Declaration

(for Use After Close of Prosecution or
With Continuation-In-Part Application)

As an applicant in the above-identified application, I declare as follows:

1. If only one inventor is named below, I am a sole inventor, and if more than one inventor is named below, I am a joint inventor with the inventor(s) named below of the subject matter of the above-identified application.

2. I have reviewed and understand the contents of the specification and claims, as originally filed, and as amended by the amendment(s) dated 8-8-94

3. I believe that I, and the other inventor(s) named below if more than one inventor is named below, am the original and first inventor or inventors of the subject matter which is claimed and for which a patent is sought.

4. I acknowledge the duty to disclose information which is material to the examination of the application in accordance with 37 C.F.R. Section 1.56(a), and if this oath accompanies or refers to a continuation-in-part application, I acknowledge the duty to disclose material information as defined in 37 C.F.R. Section 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

5. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

Richard J Ditzik
Signature of Inventor

_____
Signature of Joint Inventor

RICHARD J. DITZIK
Printed Name of Inventor

_____
Printed Name of Joint Inventor

Date 8 August 1994

Date _____

IN THE U.S. PATENT AND TM OFFICE

Serial No. _____

Filing Date: _____

Applicant: Richard J. Ditzik

Title: Desktop Computer With Adjustable Flat Panel Screen

Examiner: L. Lao Art Unit 2609

SECOND PRELIMINARY AMENDMENT

Commissioner of Patent and Trademarks

Washington, D.C. 20231

Sir:

This is a continuation application Under 37 CRF § 1.60 of Serial No. 08/288,882, filed 08/10/94 , which is set to issue on 09/16/97, which was a CIP of Ser. 08/084,011, originally filed on 06/29/93.

I. Please Amend the specification as follows:

IN THE SPECIFICATION:

A. At page 9, line 11 of application 08/084,011, after the sentence: "Such an implementation with battery power is well known to those skilled in the art." -- Add the following paragraph"

-- Prior art flat display devices have been combined with a microcomputer, battery pack, and associated electronics and placed inside the relatively thin display panel enclosures. This has been accomplished in several pocket computers, Personal Digital Assistants (PDA), and hand held tablet computers. For example, battery embodiments have been placed inside the IBM ThinkPad ™ 710T, Apple Computer Corporation's Newton™ , Grid System's Convertible™ 2260, and Dauphin Technology's DTR-1 computers, to name a few. In order to accomplished the above, developers typically implement the required electrical circuits via semi- conductor large scale integration (LSI) techniques. This usually results in a microcomputer, main memory, I/O, display drive and other support circuitry integrated into the circuit boards. The microprocessors that could be embodied must be low-voltage and low-current draw versions, such as Intel™ 386/486SL models. A rechargeable battery pack and power management circuitry should be included in the assembly. The battery pack may be removable via a slot on the side of the display panel assembly 2. The main battery pack typically consists of NiCd or newer Nickel Hydride type batteries. A backup battery may also be embodied. The mass memory components, of these hand held display panel assemblies, may consist of a small magnetic 2.5 or 3.5 inch disk hard drives or semiconductor Flash Memory modules. Mass memory of at least 80 MBytes are typically required. If removable, the battery pack and flash memory modules should conform to the PCMCIA Standards. These standards are important for interchangability among different manufactures. Because of the high level of LSI accomplished today , relatively thin, 1- 2 inch thick , display panel assemblies can be realized containing a flat panel display, drive circuitry, microcomputer card, support circuitry and battery pack, within a light weight enclosure.--

B. On Page 9 of the parent application , line 21, before the last paragraph that starts with "The scope of the invention ...."; add the following six paragraphs:

--- Figure 5 shows alternate embodiment of the desktop workstation system consisting primarily of a base unit 6A, display panel assembly 2, pen/stylus input means 22,

keyboard unit 7, a telephone base unit 6B and a telephone handset 26. The computer or workstation is designed for desktop computing and data communications for typical office, home or factory use. All the major functions for computing, communications, and conferencing are made available to user in this desktop arrangement. The base unit 6A, which is similar to the main unit of Fig. 1 and 2, is embodied as a somewhat smaller wedge shape enclosure, which does not take up much desk space and provides an inclined position for pen input.. The telephone base unit 6B and keyboard unit 7 are shown here as separate units, so that they can be pushed aside to make room on the desktop. Electrical cables 58 and 9 connect the handset and keyboard to the base unit 6A where most of the computer and electronic components are located. The stylus/pen 22 is connected to the computer in the base unit via an electrical cable 23.

The display panel assembly 2 is physically connected to the base unit 6A via a universal hinge arrangement 4 and an actuator assist means 8. This connection is shown in an exploded view in the figure. The universal hinge means may be embodied in many ways, such as a ball and socket joint arrangement. Thus, the display panel assembly 2 with its display screen 3, is position adjustable in a multiplicity of orientations. A Cartesian coordinate system diagram, defining the axes for translations and rotations, is shown in the figure. The panel can be rotated in Inclination angle I, Azimuth angle D, and Roll angle R. Further position adjustment means are added, to provide elevation adjustment along axis y, as shown in double arrow B.

The display panel assembly 2 may be electrically connected to the electronics in the base unit by running a cable through the hinge pin 5 and through the actuator assist means 8 attached to the hinge pin. Sufficient slack in the cable must be provided for the full height of the adjustment range. A slack take-up means should be provided, so that when the panel is in its lower elevation positions, the cable does not bind. The vertical force of actuator assist means should be roughly equal to the weight of the display panel assembly 2. The actuator assist means 8 could be embodied by several alternative devices, including an air spring, a mechanical spring, pneumatic, hydraulic, or electromechanical actuator means. One or more

actuators could be included. A means for locking and unlocking the actuator position should be provided within the assist means 4. Such actuators and locking mechanisms are well known to those in the art.

Even though flat panel display assemblies typically weigh only a few ounces, there are several reasons why an actuator assist means may be desirable. If an actuator is not implemented, and the user desires to raise the panel vertically by hand, the user would have to grab one edge of the panel and pull up. If the base unit is not secured to the table or it is not sufficiently heavy, the entire unit may lift off the table. The user would have to place one hand on the base unit and the other on the display panel and pull. Both of the above user actions are undesirable. Using two hands for a simple position adjustment, takes more time to accomplish, and the user may lose his/her's concentration during a computing task. Making the base unit heavy enough so that its weight is larger than the force applied by one's hand is also undesirable. Therefore, a telescoping actuator means 8 should be embodied with a force roughly equivalent to the weight of the display assembly 2, so that the user can easily adjust the position of the display panel by hand. The actuator means may include a locking and unlocking means for temporarily holding the display assembly in the desired position.

An alternate embodiment is shown is Figure 6A and 6B, showing front views of a desktop unit with a universal ball and socket type support and hinge means 4 attached to the display panel assembly 2, as well as other components. The support and hinge means consist of an L-shaped support member 4C, such that the display panel, when supported near the front of the base unit 6A, can be rotated about the z-axis (shown in Fig 1) and miss the front edge of the base. The L-shaped member 4C, as shown is Fig. 6A and 6B, is foreshortened (i.e., one side of the L is pointing out of the paper). Figure 6B shows a front view of the display panel, where the panel is rotated 90 degrees to the typical portrait display orientation. The locking and unlocking part 4A can be a hand knob for applying a force to a hinge means. In this embodiment, the locking knob is facing forward, toward the front of the desktop unit. Other locking/unlocking knob positions are possible. A support post 5A is fixed to the actuator assist means 8 at one end and is attached to the support and hinge means 4 at the

other. The assist actuator means 8 may consist of several telescoping arm and post members, in order to provide for greater elevation travel. The actuator means should be capable of collapsing into a unit with relatively small height dimension. This later feature is important because the height dimension of front portion base unit is relatively small. As above, the support post can be hollow to allow the electrical cable to be routed through it. An advantage of the Fig. 6A and 6B embodiment is that it provides for both landscape and portrait screen orientations in the same desktop unit, which the user can easily change by hand.

The embodiments of Fig. 5 and Fig. 6 results in a relatively integrated desktop computer and telecommunication system, designed to used by a person at his/her desk. The system is designed to replace the user's exiting telephone and desktop computer, with a general purpose integrated telephony and computing system. An unique aspect of this invention is that the wedge shaped base unit 6A, telephone handset enclosure 6B and the keyboard unit 9 are made to be small separate units, but the display panel assembly 2 can be quite large. The telephone handset and enclosure combination can be slide under the display panel assembly, to save desktop space. This embodiment allows the user to move these separate units out of the way when not in use, and pulled into position when required. ---

C. On page 3 line 5 of Preliminary Amendment Under Rules 62, please changed "1" to "5" --

IN THE DRAWINGS:

D. Please add Figs. 5, 6A and 6B (one sheet).

IN THE CLAIMS:

Please cancel Claim **1** and enter the following new Claims **22 - 29** for the record.

22. A display device stand for holding a flat panel display assembly for resting on top of a roughly flat horizontal surface of a table or desk, in such a manner so that its screen is viewable by one or more viewers, the display device stand comprising:

a. means for flat panel display assembly pivot and clamping functions, wherein clamping means is attached to the bottom edge of the flat panel display assembly;

b. a support arm means attached to the hinge and clamping means for supporting and positioning the flat panel display assembly;

c. a support pivot means attached to the support arm means, wherein the pivot and clamping means, the support arm means, and the support pivot means work in cooperation for plurality of position adjustments;

d. a base unit attached to the support pivot means, wherein the base unit provides sufficient mechanical stability for the flat panel display assembly and elements (a) - (c), when resting on a roughly horizontal surface of a desk or table.

23. A display device stand as recited in Claim 22, in which elements (a) - (c) are adapted to inclination angle and elevation translation adjustment means.

24. A display device stand as recited in Claim 22, in which (a) - (c) are adapted to inclination angle, azimuth angle, and elevation translation adjustments.

25. A display monitor adapted so that a viewer has the option to rest the monitor on a roughly horizontal surface of a desk or table, so that its screen is viewable by one or more viewers, the display monitor comprising:

a. a base unit adapted for resting onto on a roughly horizontal surface or a desk or table;

b. a base support pivot means attached to the base unit near the middle of the base unit;

c. support arm position adjustment means connected to the base support pivot means for position adjustments;

d. a panel support pivot means attached to support arm position adjustment means, and

e. a flat panel display assembly connected to the panel support pivot means near the bottom edge of the flat panel display assembly.

26. A display monitor wherein the user has the option to rest the on a roughly horizontal surface of a desk or table, so that its screen is viewable by one or more users, the display monitor comprising:

a. a flat panel display assembly defining a display screen and control electronics;

b. a first support pivot means connected to the bottom edge of the flat panel display assembly;

c. support arm position adjustment means connected the flat panel display assembly for elevation and inclination position adjustments;

d. a second support pivot means attached to support arm position adjustment means, wherein the first support pivot means, support arm position adjustment means and the second support pivot means work in cooperation for rearward and forward inclination adjustments, and for elevation translation adjustments; and

e. a base unit adapted for resting onto horizontal surfaces, wherein the base unit is connected to the second support pivot means near the rear of the base unit, wherein the user has the option to rest the base unit and elements (a) - (d) onto the roughly horizontal surface or a desk or table.

27. A display monitor as recited in Claims 26, in which the flat panel display assembly is adapted to include a computer system and battery power, wherein the flat panel display assembly is adapted be removable from the first support pivot means, such that the display assembly can be operational without connection to elements (b) - (e).

28. A display monitor as recited in Claims 25, in which the support arm position adjustment means is adapted to a multi-section telescoping post means.

29. A display monitor as recited in Claims 26, in which the support arm position adjustment means is adapted to a multi-section telescoping post means and the a second support pivot means is removed and the bottom portion of the telescoping post means is made fixed to the base unit.

II. REMARKS

The following Sections **A - D** below correspond to the Sections **A - D** in the above amendment changes previously made.

A. As requested by the examiner in OA mailed on 01/04/94, a clarifying paragraph was added to application 08/084,011 in Amendment **A** mailed 02/21/94.

B. In the first Preliminary Amendment for the File Wrapper CIP, mailed on 08/10/94, of 8/288,882, six paragraphs of text were added.

C. In Amendment **B** of 08/288,882 mailed 08/14/96, on page 3 of the Preliminary Amendment, second paragraph, line 5, a typographical error occurred in the words "as shown in Fig 1" and was changed to -- as shown in Fig. 5 --

D. In the Preliminary Amendment 08/288,882 filed 08/10/94, Fig. 5, Fig. 6A and Fig. 6B were added in a new drawing sheet page 5.

III. Request For Notice Of Allowance

Claims **22 - 29** particularly point out additional subject matter that the applicant regards as the invention under the meaning of 35 U.S.C. § 112. Furthermore the claims are novel, and

non-obvious under the meaning of 35 U.S.C. § 102 and § 103. **No new matter has been added.** Thus a Notice of Allowance is most respectively solicited.

Sincerely,

Richard J. Ditzik

Richard J. Ditzik
Applicant Pro Se

3143 Carnegie Court
San Diego, CA 92122
(619) 661-2252

Date: 9-13-97

IN THE U.S. PATENT AND TM OFFICE

Serial No. _____

Filing Date; _____

Applicant: Richard J. Ditzik
Title: Desktop Computer With Adjustable Flat Panel Screen

Examiner: L. Lao Art Unit 2609

A Continuation-In-Part of Serial No. 08/084,011; Filed: 06/29/93

Date: August 8, 1994

PRELIMINARY AMENDMENT

Commissioner of Patents and Trademarks
Washington, D.C. 20231

Sir:

This is a Continuation-In-Part of the application of record, Serial No. 08/084,011; filed 06/29/93, and is in response to the examiner's Office Action dated 05/23/94.

IN THE DRAWINGS:

Please add the enclosed one new drawing sheet page 5 of 5 to the drawings of record. The new drawing sheet shows Fig. **5**, Fig. **6A** and Fig. **6B**.

IN THE SPECIFICATION:

On Page 9, line 21, *before* the last paragraph that starts with "The scope of the invention ...."; ***add*** the following ***six*** paragraphs:

--- Figure **5** shows alternate embodiment of the desktop workstation system consisting primarily of a base unit **6A**, display panel assembly **2**, pen/stylus input means **22**, keyboard unit **7**, a telephone base unit **6B** and a telephone handset **26**. The computer or workstation is designed for desktop computing and data communications for typical office, home or factory

use. All the major functions for computing, communications, and conferencing are made available to user in this desktop arrangement. The base unit **6A**, which is similar to the main unit of Fig. **1** and **2**, is embodied as a somewhat smaller wedge shape enclosure, which does not take up much desk space and provides an inclined position for pen input.. The telephone base unit **6B** and keyboard unit **7** are shown here as separate units, so that they can be pushed aside to make room on the desktop. Electrical cables **58** and **9** connect the handset and keyboard to the base unit **6A** where most of the computer and electronic components are located. The stylus/pen **22** is connected to the computer in the base unit via an electrical cable **23**.

The display panel assembly **2** is physically connected to the base unit **6A** via a universal hinge arrangement **4** and an actuator assist means **8**. This connection is shown in an exploded view in the figure. The universal hinge means may be embodied in many ways, such as a ball and socket joint arrangement. Thus, the display panel assembly **2** with its display screen **3**, is position adjustable in a multiplicity of orientations. A Cartesian coordinate system diagram, defining the axes for translations and rotations, is shown in the figure. The panel can be rotated in Inclination angle **I**, Azimuth angle **D**, and Roll angle **R**. Further position adjustment means are added, to provide elevation adjustment along axis y, as shown in double arrow **B**.

The display panel assembly **2** may be electrically connected to the electronics in the base unit by running a cable through the hinge pin **5** and through the actuator assist means **8** attached to the hinge pin. Sufficient slack in the cable must be provided for the full height of the adjustment range. A slack take-up means should be provided, so that when the panel is in its lower elevation positions, the cable does not bind. The vertical force of actuator assist means should be roughly equal to the weight of the display panel assembly **2**. The actuator assist means **8** could be embodied by several alternative devices, including an air spring, a mechanical spring, pneumatic, hydraulic, or electromechanical actuator means. One or more actuators could be included. A means for locking and unlocking the actuator position should be provided within the assist means **4**. Such actuators and locking mechanisms are well known to those in the art.

Even though flat panel display assemblies typically weigh only a few ounces, there are several reasons why an actuator assist means may be desirable. If an actuator is not implemented, and the user desires to raise the panel vertically by hand, the user would have to grab one edge of the panel and pull up. If the base unit is not secured to the table or it is not sufficiently heavy, the entire unit may lift off the table. The user would have to place one hand on the base unit and the other on the display panel and pull. Both of the above user actions are undesirable. Using two hands for a simple position adjustment, takes more time to accomplish, and the user may lose his/her's concentration during a computing task. Making

the base unit heavy enough so that its weight is larger than the force applied by one's hand is also undesirable. Therefore, a telescoping actuator means **8** should be embodied with a force roughly equivalent to the weight of the display assembly **2**, so that the user can easily adjust the position of the display panel by hand. The actuator means may include a locking and unlocking means for temporarily holding the display assembly in the desired position.

An alternate embodiment is shown is Figure **6A** and **6B**, showing front views of a desktop unit with a universal ball and socket type support and hinge means **4** attached to the display panel assembly **2**, as well as other components. The support and hinge means consist of an L-shaped support member **4C**, such that the display panel, when supported near the front of the base unit **6A**, can be rotated about the z-axis (shown in Fig (1) 5 and miss the front edge of the base. The L-shaped member **4C**, as shown is Fig. **6A** and **6B**, is foreshortened (i.e., one side of the L is pointing out of the paper). Figure **6B** shows a front view of the display panel, where the panel is rotated 90 degrees to the typical portrait display orientation. The locking and unlocking part **4A** can be a hand knob for applying a force to a hinge means. In this embodiment, the locking knob is facing forward, toward the front of the desktop unit. Other locking/unlocking knob positions are possible. A support post **5A** is fixed to the actuator assist means **8** at one end and is attached to the support and hinge means **4** at the other. The assist actuator means **8** may consist of several telescoping arm and post members, in order to provide for greater elevation travel. The actuator means should be capable of collapsing into a unit with relatively small height dimension. This later feature is important because the height dimension of front portion base unit is relatively small. As above, the support post can be hollow to allow the electrical cable to be routed through it. An advantage of the Fig. **6A** and **6B** embodiment is that it provides for both landscape and portrait screen orientations in the same desktop unit, which the user can easily change by hand.

Amendment B 8-14-96

The embodiments of Fig. **5** and Fig. **6** results in a relatively integrated desktop computer and telecommunication system, designed to used by a person at his/her desk. The system is designed to replace the user's exiting telephone and desktop computer, with a general purpose integrated telephony and computing system. An unique aspect of this invention is that the wedge shaped base unit **6A**, telephone handset enclosure **6B** and the keyboard unit **9** are made to be small separate units, but the display panel assembly **2** can be quite large. The telephone handset and enclosure combination can be slide under the display panel assembly, to save desktop space. This embodiment allows the user to move these separate units out of the way when not in use, and pulled into position when required. ---

IN THE CLAIMS:

Cancel Claims 1 through 10 of record, and substitute new Claims 11 through 23, as follows:

11. In combination:

a. means for displaying information on a flat panel defining a display screen and hinge means at the bottom edge of the display means;

b. means for position adjusting of the display means in elevation and inclination, physically connected to the display means by hinge means, wherein the display means may be oriented continuously from roughly vertical and roughly horizontal;

c. means for housing electronics having hinge means located near the front of the housing means, wherein the hinge means is connected to the adjustment means, such that the display means can be oriented by hand though large ranges independently or together for ergonomic human viewing;

d. said hinge means are such that it has sufficient friction to physically support the display panel and support arms under gravity; and

e.. said housing means being sufficiently large for locating a microcomputer and other electronics, wherein the housing means also serves as a stable base for the above elements.

12. The combination as recited in Claim 11, further comprising means for input of hand written and drawn information via a stylus means, wherein the display means can be folded on top of the main housing means for ease of writing and viewing.

13. The combination as recited in Claim 11, further comprising a means for azimuth rotation of the display screen though sufficient angles, such that when combination is on a desk or table the display screen can be rotated though azimuth angles by hand to adjust for various operator positions.

14. The combination as recited in Claim 11, in which the hinge means includes a locking and unlocking means, such that the display means can be position adjusted by hand and temporarily fixed in place.

15. The combination as recited in Claim 11, in which the display means contains computing means, battery power and other associated electronics, wherein the display means can be removed from the housing means, so that a user can operate the computer while hand carrying the display means in a mobile operation.

16. A desktop personal computer unit for placement on top of a flat horizontal surface and free to slide anywhere on the surface, comprising:

a. a flat display panel assembly defining a display screen and support structure with a first hinge pair near the two bottom corners of the display panel assembly;

b. a first support arm pair physically connected to the display panel assembly via the first hinge pair, such that the display panel can be rotated in inclination angle by either hand of the operator;

c. a second support arm pair connected to the other ends of the first support arm pair via a second hinge pair;

d. means for digital data computing, which is electrically connected to the display panel assembly and which controls the display assembly's operation;

e. means for housing main electronics having a third hinge pair located near the front corners of the unit, wherein the third hinge pair connects to the other ends of the second support arm pair, such that the display panel assembly, first support arm pair and second support arm pair can be rotated by hand though large angles independently or together for ergonomic human viewing;

f. said hinge pair means are such that they each have sufficient friction to physically support the display panel and support arms under gravity; and

g. the said main housing means being sufficiently large to enclose the computing means and associated power and control electronics.

17. A desktop computer unit as recited in Claim 16, further comprising a means for input of hand written and drawn information via a stylus or pen means, wherein the display panel, first support arm pair and second support arm pair can be folded together for ease of writing and viewing.

18. A desktop computer unit as recited in Claim 16, further comprising a means for azimuth rotation of the display panel with respect to the display support structure, such that when the apparatus is on a standard desk or table the display screen can be rotated though azimuth angles by hand to adjust for various operator positions.

19. A means for interactive communications to and from external networks, comprising:

a. a flat panel display assembly defining a display screen and t hinge means attached to the display panel assembly;

b. means for orienting the position on the flat panel display screen attached to the flat panel display assembly, wherein the display screen can moved by hand through a wide range of positions;

d. a wedged shaped main unit attached to the orienting means, which may contain electronics for control of the flat panel display and other communications functions;

e. means for computing data and information electrically connected to the flat panel display, wherein the computing means may be located in the wedge shaped main unit or the flat display assembly; and

f. means for two way external data communications, wherein the external communication means may be comprised of stored programs and electronics interfaced to the computing means.

20. An interactive communications means as recited in Claim 19, further comprised of a means for pen or stylus input, electrically connected to the computing means and registered to the display screen, wherein hand written, sketch and drawing information can be entered by the user.

21. An interactive communications means as recited in Claim 19, in which the external communication means includes a telephone voice communication means interfaced to the computing means, wherein a handset, keypad, speaker and microphone may be included in the voice communications means.

22. An interactive communications means as recited in Claim 19, further comprised of a computer keyboard having a multiplicity of finger operable keys, wherein the keyboard is electrically connected to the computing means.

23. An interactive communications means as recited in Claim 19, further comprising a means for display cursor and data input control, such as a mouse or trackball device, which is electrically connected to the computing means, whereby additional user data input can be provided.

REMARKS

The above *new revised* claims are being are being submitted as part of this continuation in part application; these claims are submitted to be patentable over the art of record in the parent cases for the following reasons.

The examiner's arguments have been carefully considered. The applicant still disagrees with some points made by the examiner. For example, despite what the examiner wrote, the applicant believes that, in certain inventions, CRT displays and flat panel displays are *not interchangeable*. This is due to the **fact** that the physical size and shape of CRTs

differs greatly from that of flat panel displays. They are not interchangeable in certain cases, as in the applicant's claims, *where the display screen angle is to be adjusted through wide orientations*. In fact, the size and bulk of CRT monitors *makes it impossible to implement* with the adjustment means as required by flat panel displays. In order to design a CRT position adjustment apparatus for orientation in both elevation and inclination, *very complex* support arm and assist means must be implemented. For example, see the Hillary's very complex and expensive CRT adjustment means. Flat panels, on the other hand, can be made to be moved and positioned with very different and less complex means. **No prior art exists** that *combines* a wide position adjustment means to a flat panel display, pen input *and* computer means, plus the further limitations of the applicant claims.

Inoue IVO Nagaoka

Inoue merely teaches a flat panel display holder and extension arm position adjustment apparatus. The applicant still disagrees that Inoue discloses a "main unit". Please note that the applicant defines a main unit as: *"an enclosure or housing for control electronics including a digital computer, microprocessor or other control means."* [Spec. page 5, line 11-14] If studied closely, one can see that Inoue does not teach or disclose a main unit. Inoue's element **3.0** is merely a support "arm part", forming several subordinate support arm components (**3.1** through **3.7**). Inoue does *not* teach, nor anticipated, a main unit with enclosure for control electronics; nor is there any motivation in Inoue, even in view of Nagaoka or other prior art, to make the modifications necessary to embody the applicant's claims.

Nagaoka does not teach a screen elevation means or pen input means. What teachings or motivation in Nagaoka is there for making such modifications? Look at the modifications necessary to obtain the applicants combination. First, the screen must be disconnected from the enclosure, some how a hinged elevation means must be designed to connect both, a pen input means must be design and interfaced to the computer, and the keyboard must be removed from the enclosure. It is not obvious for a person with an ordinary skill in the art, viewing both Inoue and Nagaoka, at the time of the applicant's invention, to make such modifications. The applicant's claims provide a new and surprising result -- namely, a flat panel display-tablet combination with unexpected ergonomic pen writing, viewing and interaction operation.

Inoue *does not specifically teach* azimuth angle adjustment. Azimuth angle adjustment is defined by the applicant to be a rotation **D** about the vertical axis [page **6** line **29** and Fig. **2**]. Inoue does teach a tilt mechanism in his Fig. **10**, which allows small inclinations about the axis of pivot **46**, normal to the paper.

Inoue IVO Nagaoka and Hawkins

The same arguments as stated above for Inoue IVO Nagaoka apply here as well, plus the following arguments. As to Hawkins et al, the applicant agrees the they teach a flat panel display, a pen input means and a keyboard. However, they do not teach nor anticipate a screen elevation means, a separate keyboard, or a usable main unit. Hawkins *does not teach* a means for elevating the screen to eye level as the applicant invention does. The entire motivation of Hawkins et al is to provide a portable laptop computer that embodies a complex hinge arrangement for folding the display panel for a multiplicity of screen angles and for folding it closed for carrying. Hawkins does not teach or anticipated large vertical elevation adjustment, and there is not a motivation to do so. Their keyboard is attached to their housing, which is a severe disadvantage with pen computing. Hawkins' housing **10**, is so small that they must provide for and added shape of region **18** on the bottom of the housing for the hardware components. However, this space is still too small for the required computer components such as printed circuit board, disk or flash mass memory devices, battery package, modem, as other required associated electronics. After closely studying Inoue, Nagaoka and Hawkins, the applicant sincerely believes that there are no motivations in them to make such modifications. Thus the applicable claims of the applicant are non-obvious and should be allowed.

Hillary IVO Nagaoka

As to Hillary et al, teaches a very complex CRT display position adjustment means consisting of a platform, boom, lift levers, crank, gas strut, and other required elements. This complex gas strut assisted adjustment means is required because of the inherent bulk and weight of the CRT. The point of novelty of the applicant's invention is to use a flat panel display and very ***simple*** position means. Hillary does not teach flat panel display, pen input means, main unit with electronics, or tiltable display. There is no motivation in Hillary to modify and combine their unit with pen input. As to a tiltable display, Hillary teaches parts "to maintain the platform, and consequently the display, at a constant orientation to the horizontal" [Column **5**, line **35**]. If one with an ordinary skill in the art, looked at Hillary and Nagaoka, at the time of the applicant's invention, it would not be obvious to make the modification necessary to make the applicant invention. Therefore, the applicant's claims are non-obvious and should be allowed.

Summary

The applicant *respectively* believes that the examiner is combining several references to argue obviousness with his present day hindsight and with the applicant's disclosure in mind. By law, the examiner cannot pick and choose parts from multiple references to make

arguments for obviousness against the applicant's claims -- *with present day hindsight*. There must be some *teaching*, *anticipation* or *motivation* in the prior art references to make the particular modifications as claimed by the applicant. There are no such anticipation, teachings, or motivations in the prior art to make the claimed modifications of the applicant. Nagaoka and Hawkins disclose roughly standard laptop inventions without position adjustments means. Inoue and Hillary teach display adjustment means without computing means or pen input means. There is no motivation in Inoue or Hillary's disclosure do make the modifications to add computing means and other claimed limitations. There is no motivation in Nagaoka and Hawkin's disclosures for adding elevation position adjustment means. Therefor, the applicant respectfully *requests* that all the new claims be allowed.

Date: AUGUST 8, 1994

Sincerely,

Richard J. Ditzik
Applicant Pro Se

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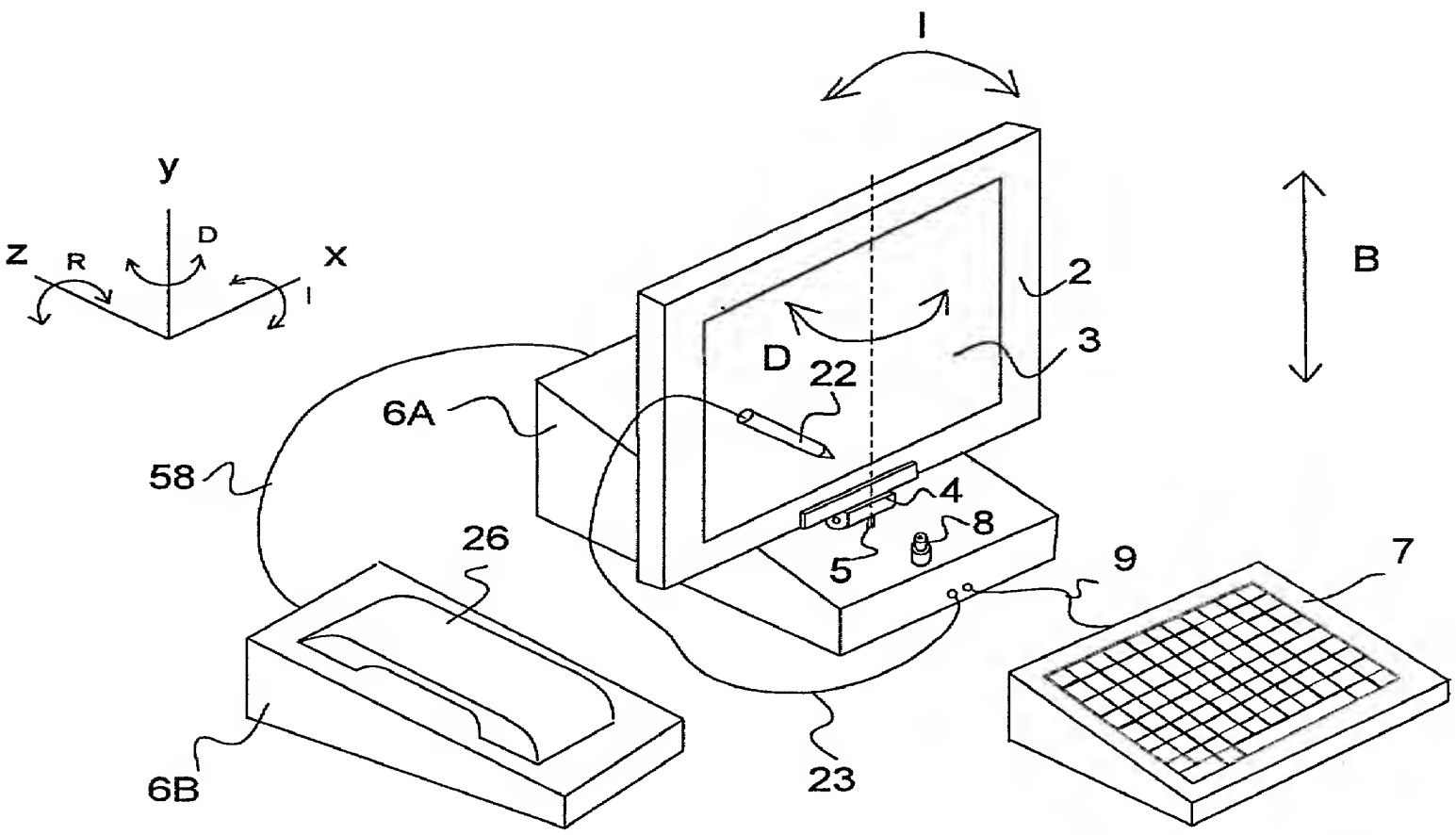

FIGURE 5

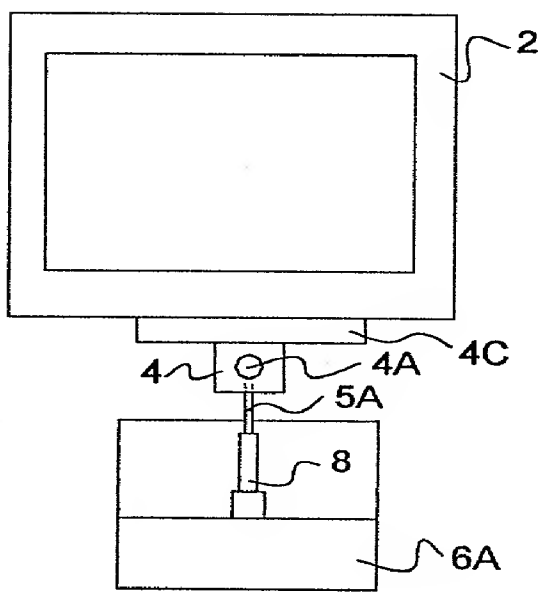

FIG. 6A

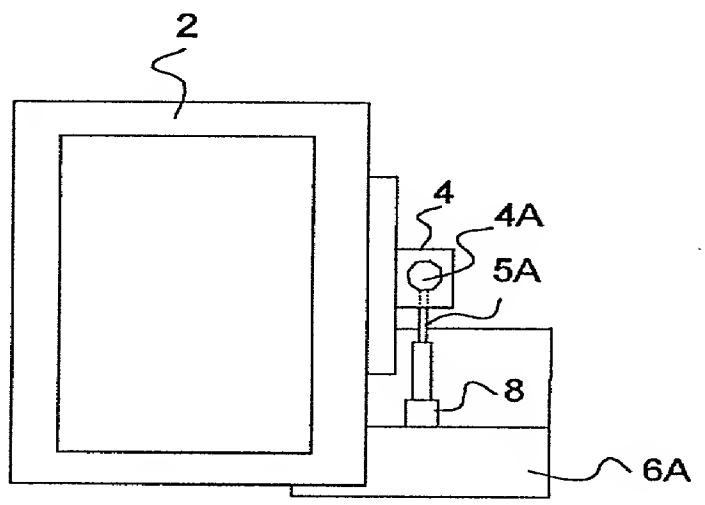

FIG. 6B

Patent Application
of
Richard J. Ditzik
for
DESKTOP COMPUTER WITH ADJUSTABLE FLAT PANEL SCREEN

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to desktop or portable computers with flat panel displays. In particular it relates to personal computers that will lie on a desk or table, which a human operator will use to: (1) enter keyboard data, pen or voice data/ information; (2) view displayed information and/or (3) hear audio/voice information.

2. Description of the Prior Art

Heretofore, portable computers with flat panel displays were embodied in a "clamshell" type design. When these prior art computers are ready for use, the display panel is unfolded to a roughly vertical orientation. The attached keyboard and computer enclosure form the bottom half of the clamshell. For portable transport, the flat panel display is folded down over the keyboard and computer enclosure. This prior art configuration has several shortcomings. First, since the unit sits on a desk or table, the screen is always at a lower elevation than the eye level of the person sitting and operating the computer. Thus the person must continually look down to the display. Over long periods of time, this will cause neck and back strain on the user. Secondly, if a pen/stylus input means is added to the display screen, the roughly vertical operating orientation is inconvenient and ergonomically incorrect when the user is handwriting or sketching. If the user tries to hold his/her arm up to write on a vertical screen, the users arm will tire. Over long periods of writing on a vertical screen, this awkward position will cause strain on one's wrist. Even if the user is willing to hold his/her hand up to write on the vertical screen, it may not be physically secure for the user's

hand pressure. Thirdly, the prior art clamshell design does not provide elevation adjustment or azimuth angle adjustment means. This restricts the ergonomic usability of the prior art computer and display units.

For example, U.S Patent 4,859,092 of Makita discloses a portable typewriter and display unit. However, a single pair of pivoting arms connect the display unit to the main body. When its display unit is raised to its highest elevation, the distance from the user's eyes to the display screen is large. Therefore, middle aged users who are near sighted, will have difficulty in viewing the screen. No pen/stylus input mean is disclosed, but even if one is added, the display unit would not provide a physically secure writing surface. The Makita does not provide a means of placing equal and opposite restraining force onto the display unit. U.S. Patent 4,624,434 of Lake discloses a tiltable display terminal, but no display unit elevation adjustment is taught. Again no pen input means is disclosed, and if one is added, the unit would not be physically stable for normal hand/arm forces applied by the user. U.S. Patent 5,115,374 of Hongoh teaches a laptop portable computer with a facsimile function. Hongoh discloses a touch panel screen, but no pen input means, and no vertical elevation adjustment of its display unit is taught. In order to provide a horizontal display orientation, the display unit must be detached from the main body and set back, in reverse orientation, to the connector sockets on the main body, which is a severe disadvantage.

Several prior art pen computer units exit. However, their display screens are fixed to their enclosure to form a flat tablet. They are designed for the mobile user market. This limits their use for desktop pen/stylus computing environments. No prior art has solved the problem of a personal computer for the office environment, capable of standard computing, pen computing, and voice telephone communications.

The invention disclosed herein solves the above problems by providing an ergonomic designed desktop system that is capable of several important computer and communications functions. It provides a display panel assembly, pen/stylus input unit, multiple support arms, and a main unit in a roughly wedge shape. The display panel assembly can be adjusted in inclination angle, azimuth angle and elevation. Thus invention overcomes the problems of the prior art. For example, the display panel of the invention can be easily adjusted by hand in elevation to a height roughly of the user's eye level. The user does not have to look down to see the screen when in normal PC-keyboard operation. If the unit is used as a pen/stylus computer, the display panel can be folded by

hand to a physically secure position, at an inclination angle that is ergonomically correct for handwriting and sketching. Finally, the display screen can be physically adjusted in many orientation combinations, including azimuth angles, inclination angles and elevation translations. Thus the invention can be used in a wide range on office desktop positions and by a wide range of users and orientations.

SUMMARY OF THE INVENTION

The disclosed invention overcomes the shortcomings of the prior art by providing display screen adjusting means for desktop computers and terminals, such that the entire apparatus is sufficiently small to be portable or transportable. The invention disclosed herein provides an easy to use desktop workstation, to which the human user can adjust its screen for many screen positions. In addition, the workstation can fold down for transport. The workstation may also include external communication means such as voice/data modem and/or telephone means.

Accordingly an object of the invention is to provide small compact workstation for the office, having an array of useful functions and capabilities at the finger tips of the human user sitting at his/her desk. Functions may include pen/stylus input means, computer means, display device(s), mass memory devices, keyboard, mouse, speaker phone, network interface and modem.

Another object of the invention is to give the user a voice and data communications capability at the desktop, capable of standard text/graphics computing, as well as voice/video/pen communication to others individuals or computers, via modem or network (LAN/WAN) interfaces.

Still another object of invention is to provide the user with an ergonomic workstation that can be adjusted to a wide range of positions and orientations, such that there will be a reduction or elimination of body stress and fatigue by the user, over long periods of use.

Still another object of the invention is to provide a modular desktop workstation such that the user can configure the workstation to how he/she works, or to their choice at a particular time. For example, the user will have the choice of using a detached keyboard, pen/stylus input, mouse, trackball, handset telephone, or speaker telephone, depending on his/her wishes for accomplishing a particular task.

Still another object of the invention is to provide a unit that is small and light enough for the user to easily transport it to other locations. Other objects of the invention will become evident by reading the following invention descriptions and inspection of the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. **1A** is a side view of the desktop workstation with the display panel assembly oriented vertically and somewhat raised from its lowest position.

Fig. **1B** is a side view of the desktop with the display panel assembly folded to its lowest inclined position, with a stylus/pen input means.

Fig. **2** is exploded perspective view of the desktop workstation with a telephone means placed on one side.

Fig. **3** is a general block diagram of the electrical elements of the invention.

Fig. **4** is a general flow diagram of the software that may execute on the workstation's digital computing means.

DETAILED DESCRIPTION

The invention can be described with reference to Fig. **1A** and **1B** shows a desktop workstation from the side in two different display screen orientations and modes of operation. The term desktop workstation is defined to be an interactive man-machine or man-computer interface, in which a human being can enter and view data/information. The workstation or interface may or may not include a digital computing means. A display panel assembly **2** is attached to a support structure **4** via a hinge pin **5**. The support structure **4** is connected to a support arm **12** via a hinge means **14**. The display panel assembly **2** includes a relatively thin display device further defining a viewing screen. Examples of the possible display technologies are Liquid Crystal Displays (LCD), electro-luminescent, plasma panel, and field emission displays. They may be monochrome or color, and they could be light modulator or light emitter types of displays. LCD's are most commercially available flat panel display devices, available in a wide variety of sizes, shapes, resolutions and other characteristics.

Typical of these LCD's is the Sharp Electronics Corporation's LM64P90 and LM64K90 monochrome LCD's. They have a 640 x 480 display pixel format, a viewing area of 196 x 148 mm, a dot pitch of 0.30 x 0.03 mm, and cold cathode fluorescent backlight. The former has 150 ms rise plus fall response time, a transmissive viewing mode, 50 Nits brightness, and 13:1 contrast ratio. The latter has a 250 ms rise plus fall response time, a transflective viewing mode, 35 Nits brightness, and 10:1 contrast ratio. For

many applications, color LCD's are required. Sharp Electronics Corp. makes several direct-view color Thin Film Transistor (TFT) LCD modules. Typical specifications for their LQ10DH11 product are a 640 (x3) X 480 display pixel format, 211 x 158 mm viewing area, a 0.33(0.11x3) X 0.33 mm dot pitch, a hot cathode fluorescent backlight.

The display panel assembly 2 is free to rotate through large inclination angles (at least 90 degrees), represented by rotation **A**, about the hinge axis of hinge means **14**. Support arms **12** and **8** in turn connect the display panel to the workstation a main unit **6**. The main unit may include an enclosure or housing for control electronics including a digital computer, microprocessor or other control means. The display panel assembly **2** may be electrically connected to electronics located in the main unit **6**, via an electrical cable routed inside the support structure **4** and support arms **12** and **8**, or via a cable routed externally to the main unit. The size of main unit **6** should be small, so as to not present a large "foot print" on the desk or table. The unit should be easily carried by one person. The invention may powered by light weight batteries or it may be an AC powered workstation.

The support arm **8** is attached to support arm **12** by a hinge means **16**, such that the latter arm can be rotated though rotation **C** about the axis of the hinge means, as shown in Fig. **1A**. Support arm **8** is attached to the main unit **6** by hinge means **20**, such that the arm can rotate though large angles as shown in rotation **B** about the axis of the hinge means. Thus the above mechanical elements can work in combination, and the user is can adjust the orientation of the display panel assembly **2** in both inclination angle and elevation. The friction of each hinge is such that the user can adjust the orientation by hand, and its position is either self-locking or can adjusted to lock in position. The lengths of the support arms **8** and **12** should be selected to provide the desired display screen elevation and forward viewing positions. Many different combinations of lengths may be embodied.

Several methods can be implemented to give the user to capability to adjust the screen in azimuth angle. One technique is to rotationally attach the display panel assembly **2** to a support structure **4** via a cylindrical hinge pin **5**, so that the display can rotate through azimuth angles. The hinge pin **5** can be made hollow so that electrical conductors can be routed through it to the support structure **4**. Another method would be to place the main unit on stationary base structure via a lazy-susan structure. Rubber feet may be placed under the main unit, as shown in the figure. The weight of the display panel assembly **2** should be as

low as possible, and the mass of the main unit and its electronics should be large enough so that if the display assembly is adjusted in the extreme forward position, the unit will remain physically and gravitationally stable. A computer keyboard unit 7 is shown connected to the main unit 6 via an electrical cable 9. The computer keyboard unit 7 may be attached or detached. If it is a detached keyboard, the electrical signals may be transmitted to the computer via wires or electromagnetic radiation means.

Fig. 1B shows the workstation of in Fig. 1A, except the display panel is folded down to its lowest inclined position and a stylus input means 22 is included. The stylus input means is defined to be a stylus or pen position encoding device that encodes, in two or three dimensions, the position of a hand-held stylus, as the user moves it over an active area corresponding to the display screen. The screen of the display panel is facing upward and at a convenient inclined angle for user hand writing, drawing and sketching with the stylus or pen. An electrical wire/cable 23 may be used to connect the pen/stylus to the control electronics in the main unit. A natural inclined angle of the screen for stylus/pen data input is roughly 30 degrees from the horizontal. However, the display panel assembly may be locked into position at a multiplicity of orientations.

Another embodiment is shown in Fig. 2, which presents a perspective view of another embodiment of the invention, where several elements are shown in exploded view, for clarity. A display panel assembly 2 including its display screen 3 is rotationally connected to the support structure 4 via the cylindrical hinge pin 5. The display panel assembly is then free to rotate through wide azimuth angles D as shown. The support structure 4 is connected to support arm pairs 12A and 12B via hinge means 14A and 14B. The cylindrical shafts of hinges 14A and 14B, which may be threaded, fit in the round holes of the support arm pairs 12A and 12B. Support arm pair 8A and 8B is attached to the previous arm pair at hinge elements 16A, 16B and 16C, where element 16B is a long shaft, the ends of which may be threaded. The other ends of support arm pair 8A and 8B are attached to the main unit 6 via hinges 20A and 20B. The friction of each hinge means may be adjusted by a threaded shaft or screw 19 and a standard nut 17 or a finger tightened nut/knob 17A. The friction should be sufficient to support the display panel assembly under the gravitational and normal hand writing/sketching forces.

As shown in Fig. 2, a telephone unit may be added or integrated into the desktop workstation. A telephone handset 26 and cord 32 may located either side of the workstation. A telephone

keypad 28 should be placed in a convenient location of the user. For a hands-free telephone operation, a microphone 30 and speaker 36 may be included. The telephone unit may be attached or detached from the main unit. The telephone may function during workstation operation and/or independently of the workstation operation. A computer keyboard, mouse or trackball devices may be included, in addition to the stylus/pen input means. All controls should be designed to be simple and easy to use.

Fig. 3 shows a block diagram of the basic electrical elements of the computer workstation. The pen/stylus input means' electronics 36 can be interfaced directly to flat panel display device electronics 38. Examples of available products that have combined these functions are the Super-K™ display tablet from SuperScript Inc., Video Tablet from Kurta© Corporation, and the PL-100 Integrated Tablet for Wacom Technology Corp. Typically, these products are connected to a controller card in the computer's I/O bus, via a cable. Specifications for such display-tablet include: active area 7.56 by 5.67 inches, accuracy ±0.02 inch, resolution 1016 PPI, data transfer rate 270 coordinate pairs/sec., pen slew rate up to 135 IPS without significant distortion, and stylus/pen weight 15 grams.

As shown in the figure the flat panel display is electrically connected to the workstation microcomputer/controller **44**. The microcomputer may be any one of several commercially available products, such as the Intel™ 86286, 86386 or 86486 processors, Motorola Corporation's 68030 or 68040 processors, as well as several others. If the workstation is to be battery powered, then low voltage (3V) low-power microprocessors should be used. The microcomputer/controller **44** may be embodied by several means.

One available microcomputer system that may be used, is the Moby Brick product manufactured by Ergo Computing of Peabody MA. The Moby Brick product consists of a 386/486 CPU, with 4 to 32MB RAM, hard disk s from 170MB to 1GB, built in video controller, a 3.5 inch 1.44MB floppy drive, two serial ports, one parallel port and one ISA 16 bit half length card slot. All the above is built into a 7.9 x 11.3 x 3.3 inch module that weighs 8.7 lbs. The CPU required by the invention may be a 20 MHz 386SX, 33/40MHz 386DX, or the 33MHz 486DX. Either internal or external modems may be embodied in to the system. An optional expansion chassis may be added to the system with four slots for ISA cards.

Fig. 4 shows a general flow diagram of typical stored program software that may execute in the microcomputer or processor **44**. Many commercial available operating systems, window environment and

application software are available to run in the microcomputer. Typical operating systems that could be used include Microsoft Corporation's MS-DOS™, IBM's OS/2™, Go Corporation's Pen Point or various companies' UNIX products. Possible windowing environments include Microsoft's Windows™ 3.x and Windows for Pen™, Hewlett-Packard's New Wave™, or X-Windows from various companies. Software may be pen centric like Pen Point™ software or it may be just pen/mouse aware. As shown in Fig. 4, after a standard power up and the system diagnostics and checkout is completed the operating system is loaded. Depending on the desired configuration a number of device driver, TSR's, communication programs and pen/stylus control programs may be loaded. The workstation should be capable of either running windows or non-windows environments.

The microcomputer/controller **44** of Fig. 3 includes associated support electronics, I/O devices and power supply. All the above should be compact in size, so that the size of the overall desktop workstation is as small as practical. The advantage of small size is that it provides a smallest footprint of the desk. This is important in office environments, where desk space is at a premium. The main unit's footprint dimensions, on the desktop, could be in the range of 15 by 13 inches, depending of the size of the screen and whether of telephone handset is included.

The keyboard function **42** may be electrically connected to the microcomputer/controller **44**. A standard mouse/trackball unit **46** may be connected to the microcomputer via an I/O card or serial port in the standard manner. Both the pen and mouse/trackball interfaces may be desirable in certain applications. An external communication means **46** is connected to the microprocessor. The communications means could be embodied by a communications I/O card, internal/external modem or other communication means. However embodied, the workstation shall have the capability to communicate data (text, graphics, video, and voice) interactively on either Wide Area Networks (WAN) **50** or Local Area Networks (LAN) **52**. The WAN in its simplest form may consist for two workstations connected to each other via internal/external modems over standard or hi-speed telephone lines.

Either an external or internal (built-in) telephone/speaker phone **48** may be connected to the microprocessor/controller. It may integrated into the workstation or embodied as a stand alone device, depending on the user's requirements. The telephone/ speaker phone may also be connected to ordinary telephones lines **54** or wireless/cellular networks **56**. The primary purpose of the external communication means of the workstation is to provide two way interactive text, graphics (including pen/stylus), video and

voice/audio communication to: (1) other users operating similar workstations (at the same time or unattended), and/or (2) one or more computers on a network of computers or terminals. Other standard computing and communication components may be added to the invention that are obvious to those skilled in the art.

In another embodiment, the microprocessor and support electronics **44** can be located at the display panel assembly **2**, instead of the main unit **6**. For example, they may be located on one or more printed circuit boards surrounding and behind the display screen. Such an implementation with battery power is well known to those skilled in the art. The display panel and computer assembly can then be removed from the support structure **4** and hinge pin **5**, as shown in Fig. **1A** by a typical removal direction **E**. This can be accomplished by a simple plug and socket arrangement at the bottom of the display panel assembly. An advantage of this implementation is that two modes of user operation are then possible. One is the desktop operation as described above. The other is a portable mobile display-tablet operation. The user has the option to remove the display-computer unit from the socket, and use it as notebook computer or display-tablet.

The scope of the invention disclosed here should be determined by the appended claims and their legal equivalents, rather than by the examples given above.

I claim:

1. An apparatus for man-machine interface which comprises:

a. a display panel defining a display screen and hinge means at the bottom edge of the display panel;

b. a first support arm physically connected to the display panel hinge such that the display panel can be rotated by the human operator by hand;

c. a second support arm connected to the other end of the first support arm via a second hinge means;

d. a main unit having a third hinge means located near the front of the unit, wherein the third hinge means is connected to the other end of second support arm, such that the display panel, first support arm and second support arm can be rotated by hand though large angles independently or together for ergonomic human viewing;

e. said hinge means are such that they each have sufficient friction to physically support the display panel and support arms under gravity; and

f. the said main unit being sufficiently large and having sufficient mass to provide a gravitationally stable platform at all position adjustments.

2. An apparatus of claim 1, further comprising a means for input of hand written and drawn information via a stylus input means, wherein the display panel, first support arm and second support arm can be folded together for ease of writing and viewing.

3. An apparatus of claim 1, further comprising a means for azimuth rotation of the display screen though sufficient angles, such that when the apparatus is on a desk or table the display screen can be rotated though azimuth angles by hand to adjust for various operator positions.

4. An apparatus of claim 1, in which the friction of the hinge means can be adjusted via hand tightened nut means, such that the hinge means can be locked securely in place for normal operating forces and to increase the friction over time to compensate for normal ware.

5. A desktop computer comprising:

a. a display panel assembly defining a display screen and support structure with a first hinge pair near the two bottom corners of the display panel assembly;

b. a first support arm pair physically connected to the display panel assembly via the first hinge pair, such that the

display panel can be rotated in inclination angle by either hand of the operator;

c. a second support arm pair connected to the other ends of the first support arm pair via a second hinge pair;

d. a means for digital data computing for, which is electrically connected to the display panel assembly and which controls the display assembly's operation;

e. a main unit having a third hinge pair located near the front corners of the unit, wherein the third hinge pair connects to the other ends of the second support arm pair, such that the display panel assembly, first support arm pair and second support arm pair can be rotated by hand though large angles independently or together for ergonomic human viewing;

f. said hinge pair means are such that they each have sufficient friction to physically support the display panel and support arms under gravity; and

g. the said main unit being sufficiently large to enclose the computing means including its power and associate electronics.

6. A desktop computer of claim 5, further comprising a means for input of hand written and drawn information via a stylus or pen means, wherein the display panel, first support arm pair and second support arm pair can be folded together for ease of writing and viewing.

7. A desktop computer of claim 5, further comprising a means for azimuth rotation of the display panel with respect to the display support structure, such that when the apparatus is on a standard desk or table the display screen can be rotated though azimuth angles by hand to adjust for various operator positions.

8. A desktop computer of claim 5, in which the display panel assembly contains the computing means and battery power, so that the display panel assembly can be removed from the main unit, so a user can operate the computer while hand carrying it in a mobile fashion.

9. A desktop computer communications workstation comprising:

a. a display panel assembly defining a display screen and first hinge pair at the two bottom corners of the display panel assembly;

b. a first support arm pair physically connected to the display panel by via the first hinge pair, such that the display panel can be rotated by the human operator by hand;

c. a second support arm pair connected to the other ends of the first support arm pair via a second hinge pair;

d. a main unit having a third hinge pair located near the

front of the unit at each corner of the unit, wherein this third hinge pair connects to the other ends of the second support arm pair, such that the display panel, first support arm pair and second support arm pair can be rotated by hand though large angles independently or together for ergonomic human viewing;

e. a means for digital data computing for system control of the workstation and data communications, which is electrically connected to the display panel;

f. a means for two-way telephone voice communication which is interface to the computing means, wherein a handset, keypad, speaker and microphone may be included in the voice communications means;

g. a touch sensitive input screen and electronics, wherein the input screen may be sensitive to a pen or stylus, and wherein the electronics is connected to the computing means;

h. a computer keyboard having a multiplicity of finger operable keys, wherein the keyboard electrically connected to the computing means; and

i. a means for providing azimuth rotation to the display panel, wherein the user is able to adjust the position by hand and self-locking to a fixed position for viewing and data input.

10. A desktop computer communications workstation of claim 9, further comprising a mouse or trackball data input device electrically connected to the digital computing means, whereby additional user data input means is provided.

ABSTRACT

A relatively small transportable desktop computer/workstation with a display panel assembly (2) in combination with a microprocessor or controller (44) is made display screen position adjustable, in inclination angle, azimuth angle and elevation translation movements. The workstation can have a pen or stylus touch screen input function (36) added, so that a user or operator can write, draw and sketch directly onto the screen in a natural manner. The workstation can be placed on top of a desk or table providing an ergonomic man-machine interface for information communications between individual users via a communications network. A keyboard (7, 42), voice/ speaker telephone (48), mouse or trackball input unit (46), and communications modem (42) may be added to the workstation. The flat panel display, pen input means and microprocessor can be combined into an assembly, which can be removed from the main body for portable mobile computing operation.

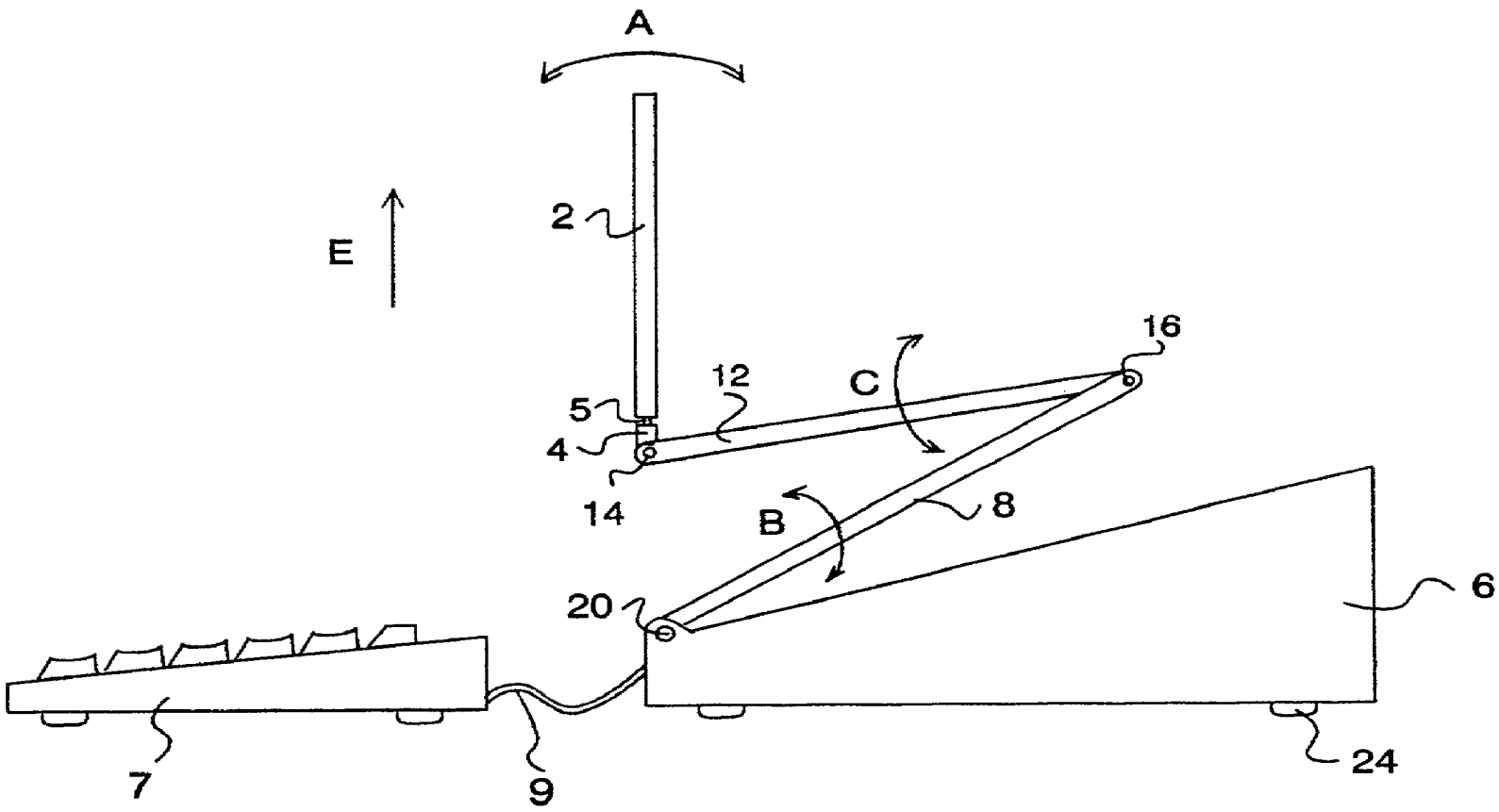

FIG. 1A

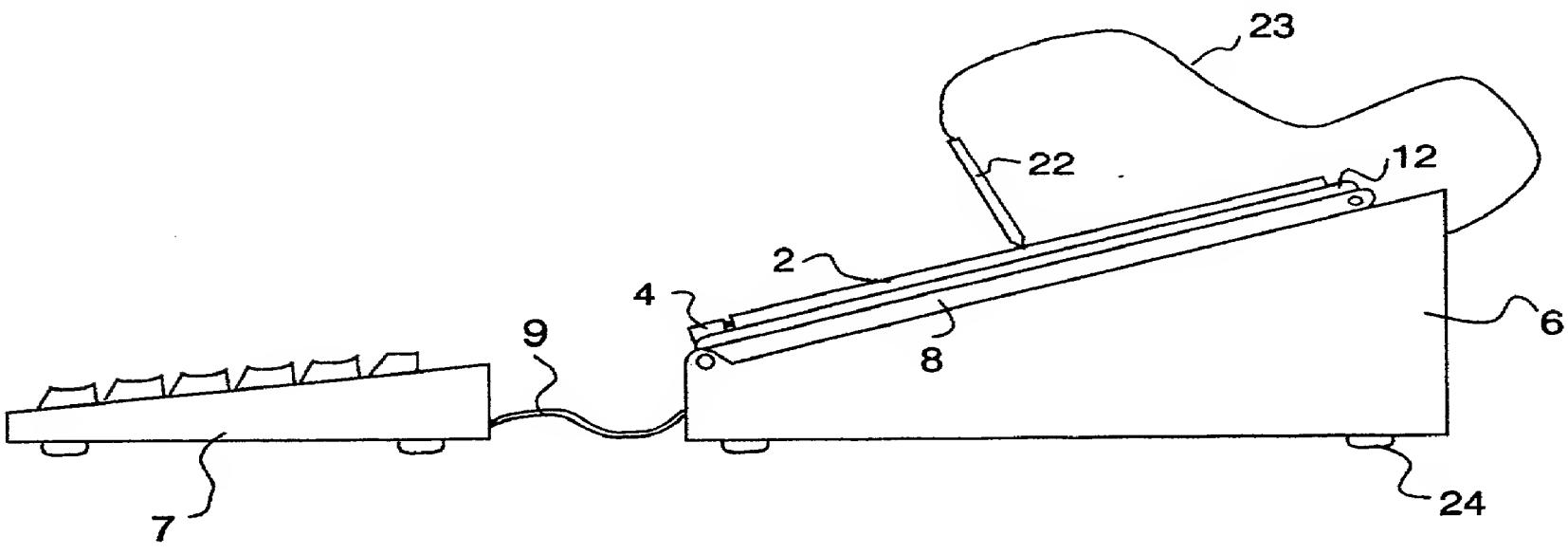

FIG. 1B

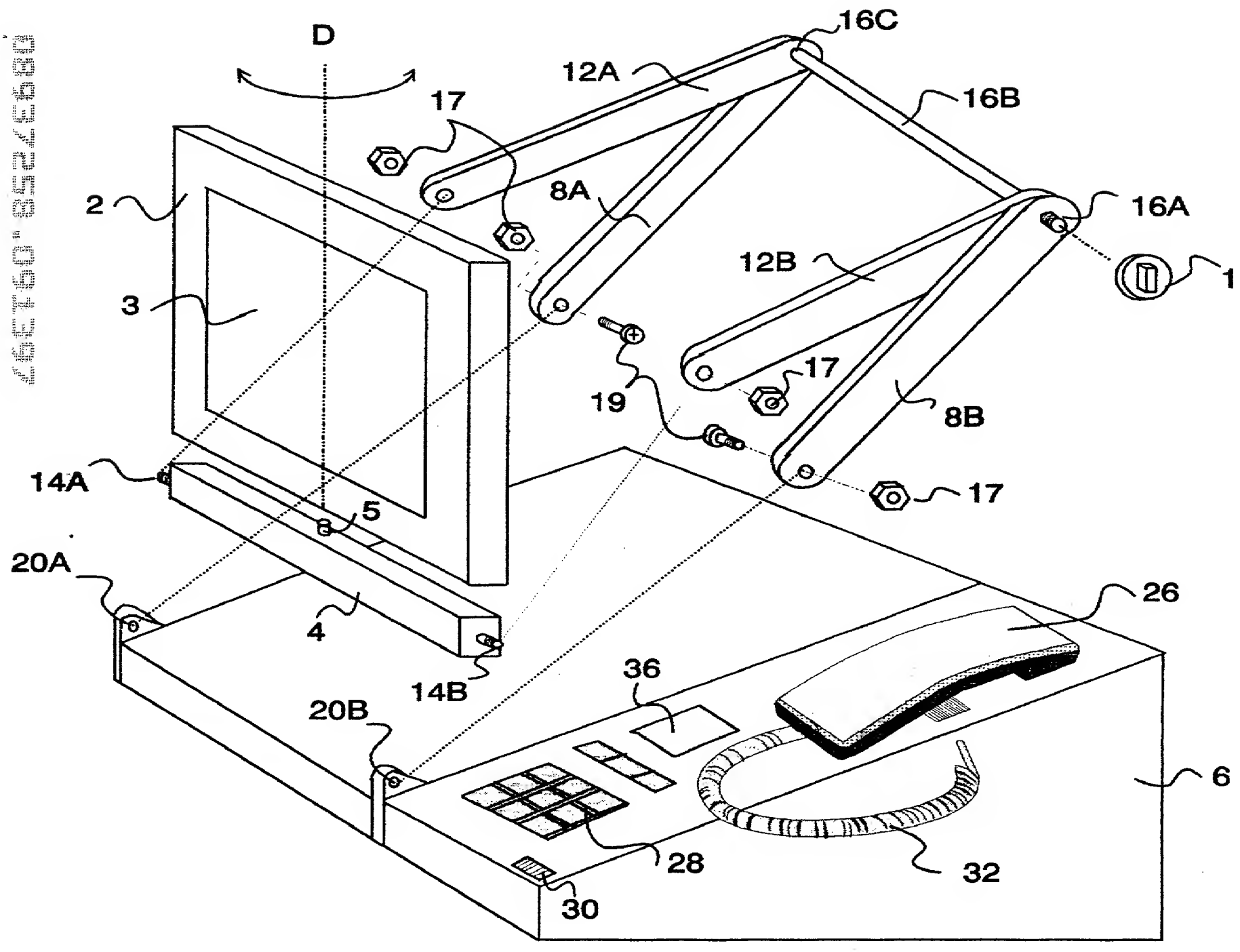
D
16C
12A
16B
17
8A
16A
2
12B
17A
3
17
19
8B
14A
17
5
20A
26
4
36
14B
20B
6
28
32
30

FIG. 2

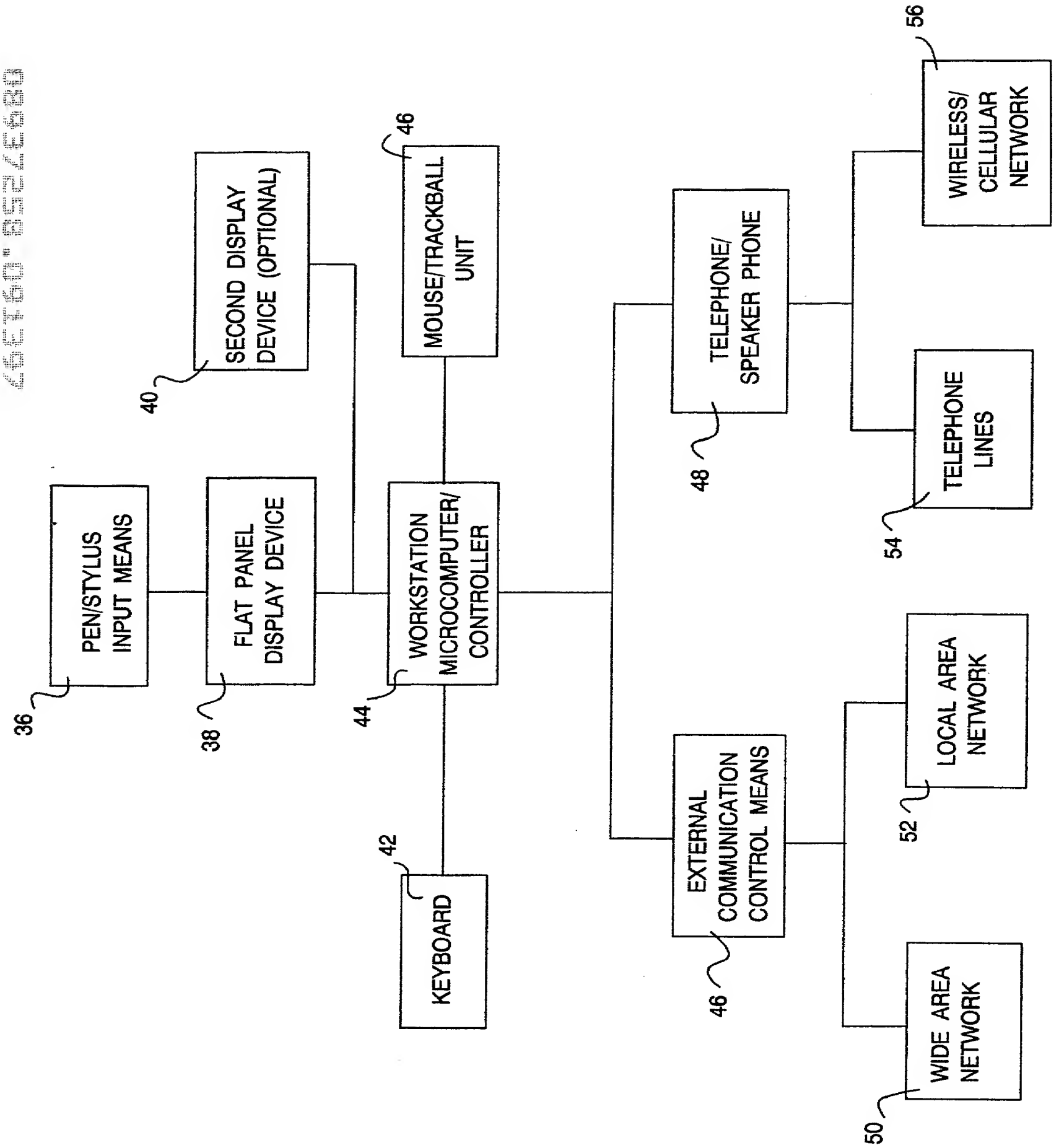
SECOND DISPLAY DEVICE (OPTIONAL)
40
MOUSE/TRACKBALL UNIT
46
PEN/STYLUS INPUT MEANS
36
FLAT PANEL DISPLAY DEVICE
38
WORKSTATION MICROCOMPUTER/ CONTROLLER
44
KEYBOARD
42
TELEPHONE/ SPEAKER PHONE
48
WIRELESS/ CELLULAR NETWORK
56
TELEPHONE LINES
54
EXTERNAL COMMUNICATION CONTROL MEANS
46
LOCAL AREA NETWORK
52
WIDE AREA NETWORK
50

FIG. 3

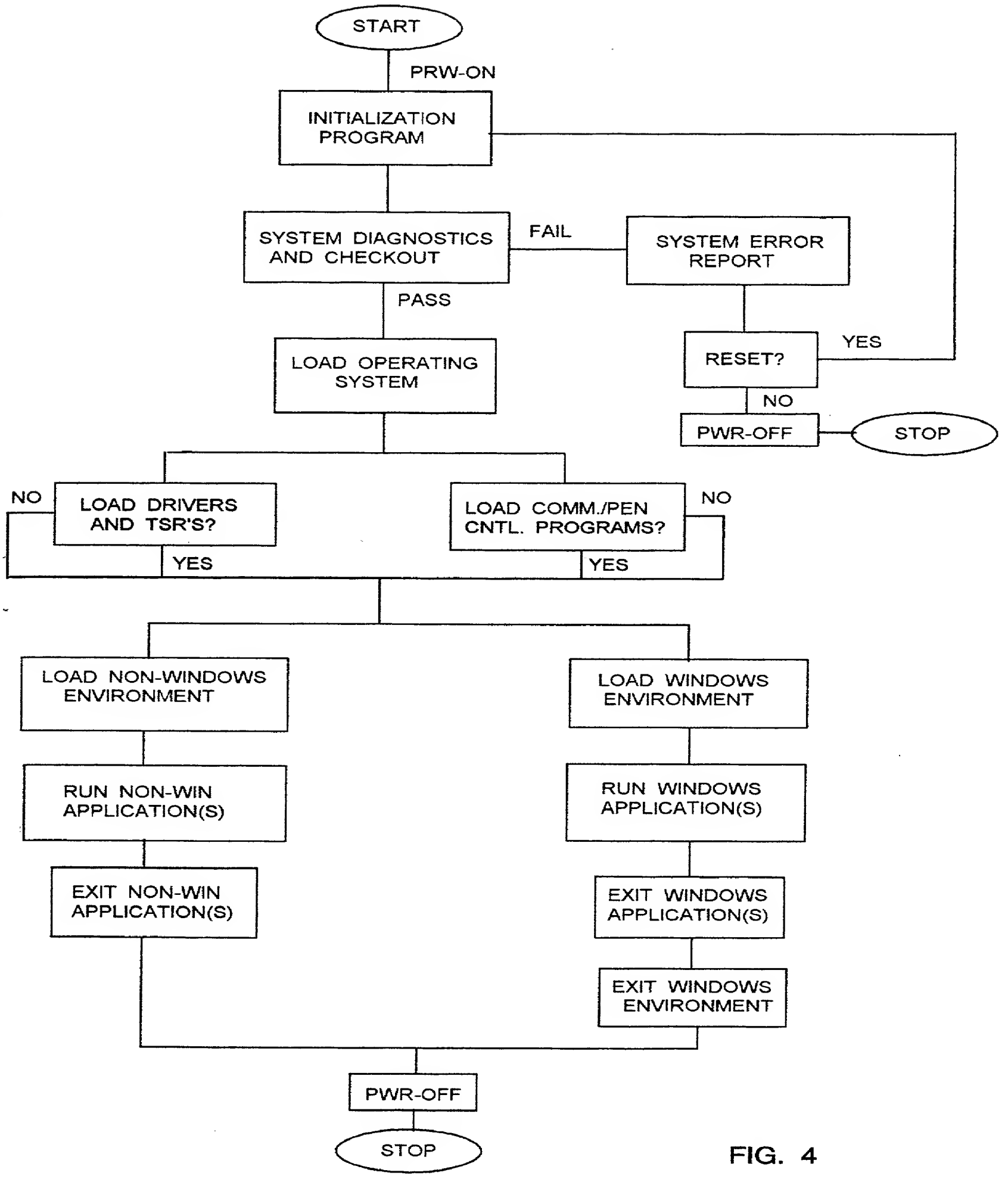
START
PRW-ON
INITIALIZATION PROGRAM
SYSTEM DIAGNOSTICS AND CHECKOUT
FAIL
SYSTEM ERROR REPORT
PASS
RESET?
YES
NO
PWR-OFF
STOP
LOAD OPERATING SYSTEM
NO
LOAD DRIVERS AND TSR'S?
YES
LOAD COMM./PEN CNTL. PROGRAMS?
NO
YES
LOAD NON-WINDOWS ENVIRONMENT
LOAD WINDOWS ENVIRONMENT
RUN NON-WIN APPLICATION(S)
RUN WINDOWS APPLICATION(S)
EXIT NON-WIN APPLICATION(S)
EXIT WINDOWS APPLICATION(S)
EXIT WINDOWS ENVIRONMENT
PWR-OFF
STOP

FIG. 4

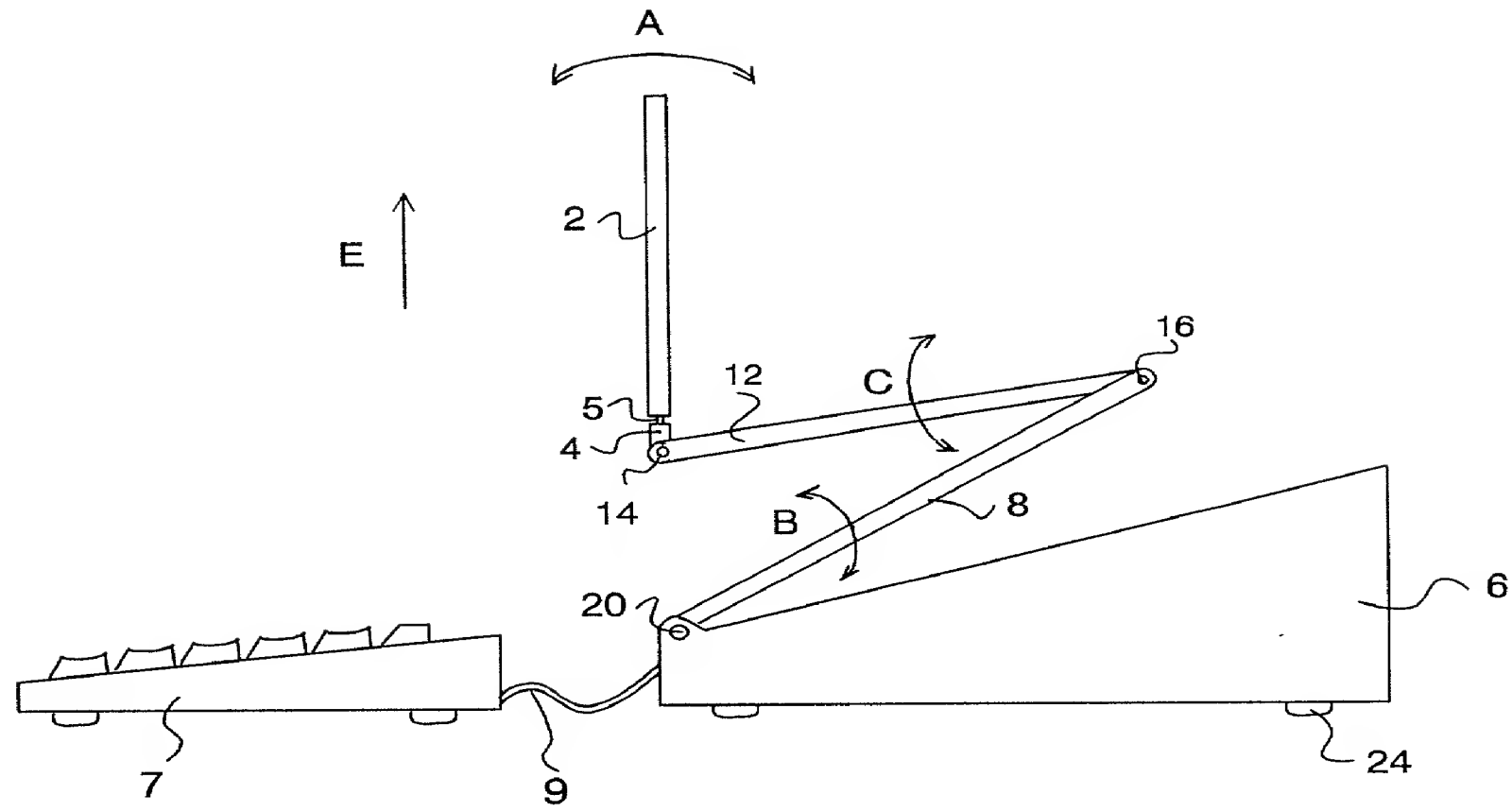

FIG. 1A

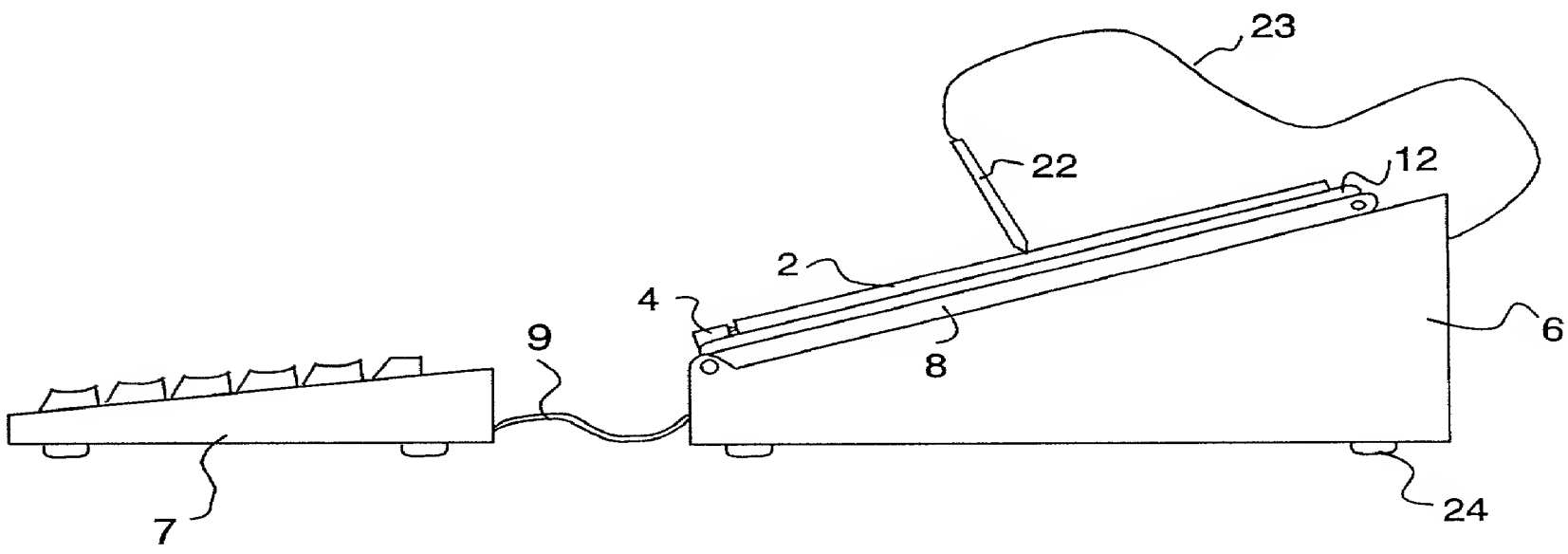

FIG. 1B

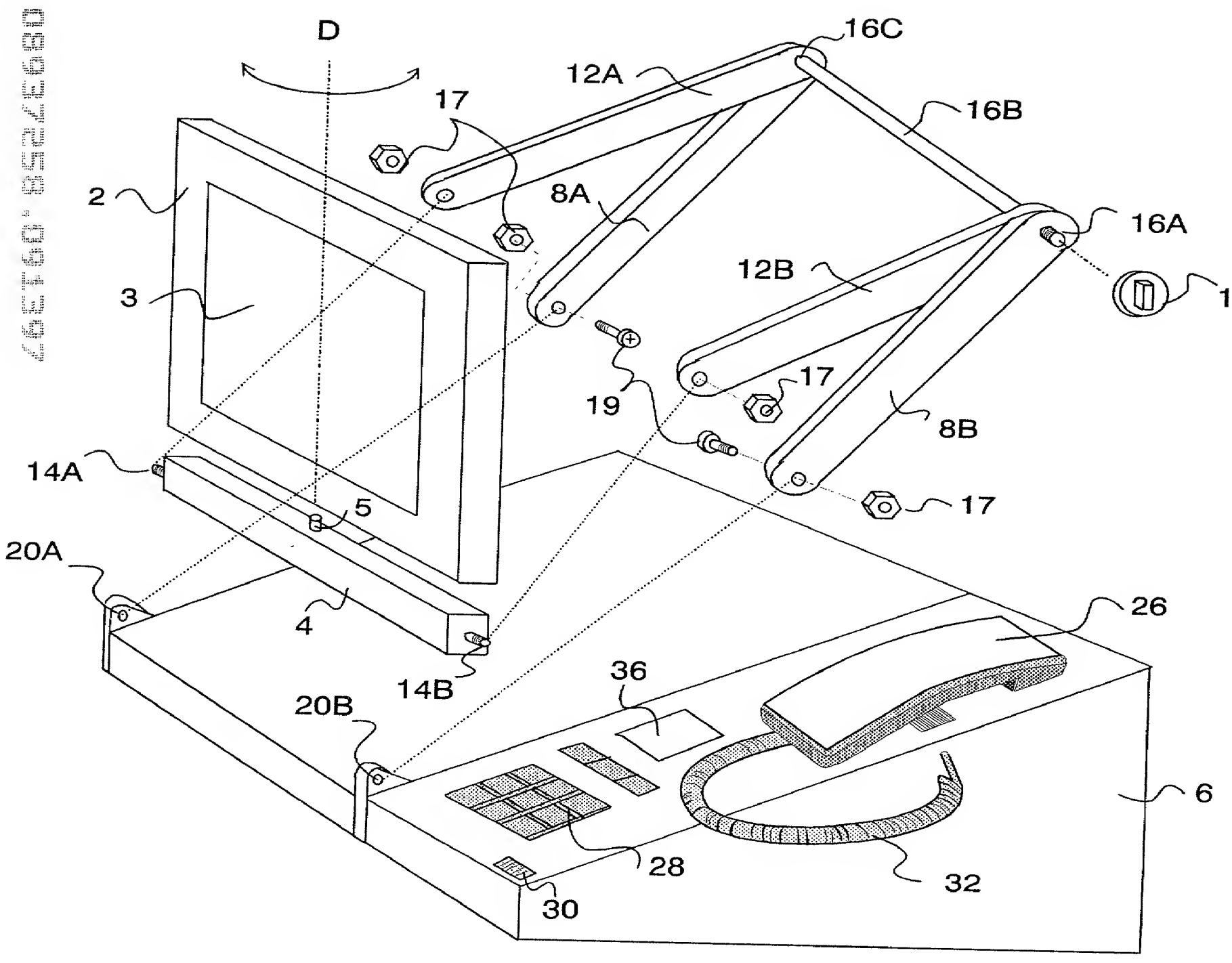
D
16C
12A
17
16B
2
8A
16A
12B
3
17A
19
17
8B
14A
5
17
20A
4
26
36
14B
20B
6
28
32
30

FIG. 2

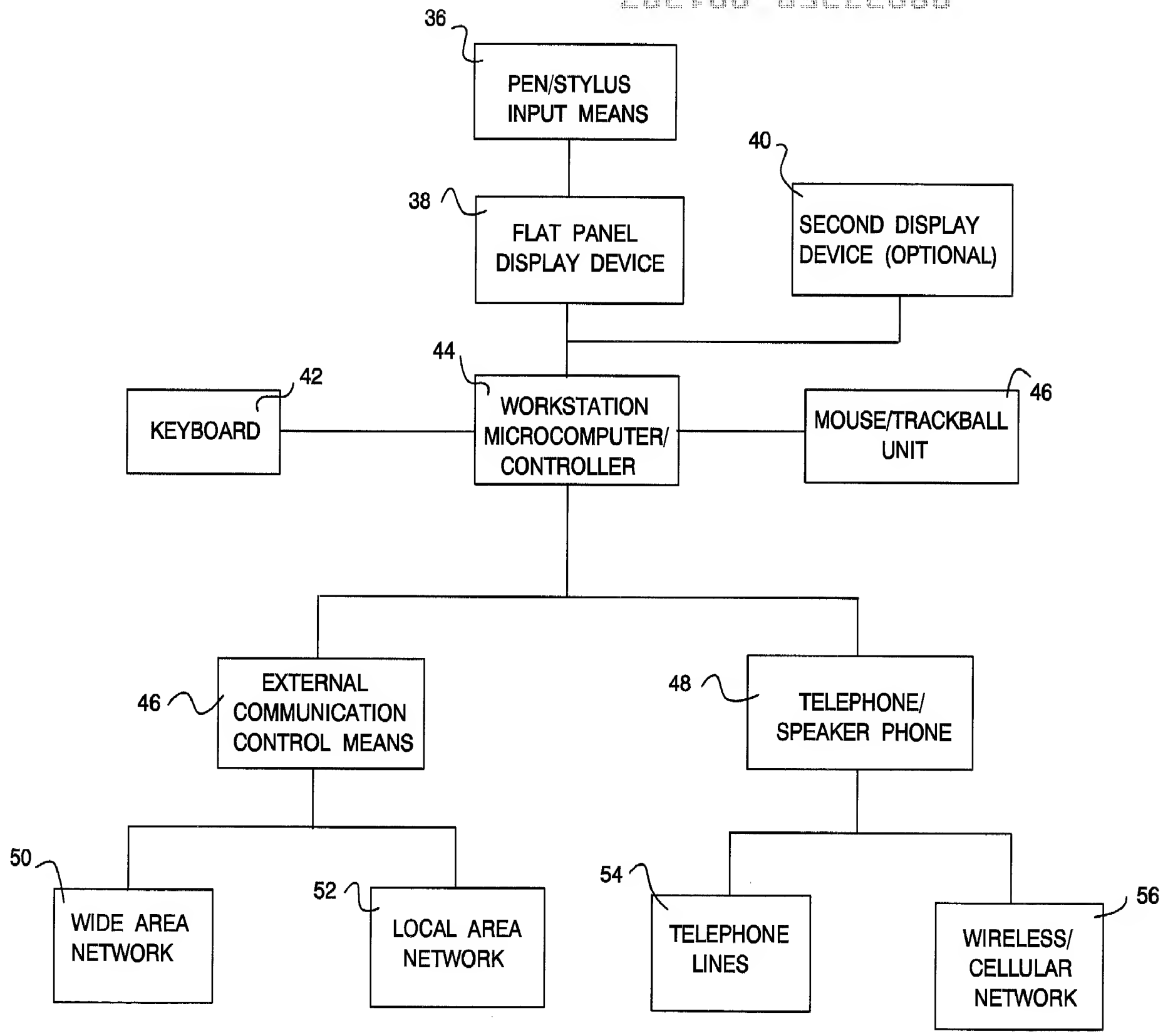

FIG. 3

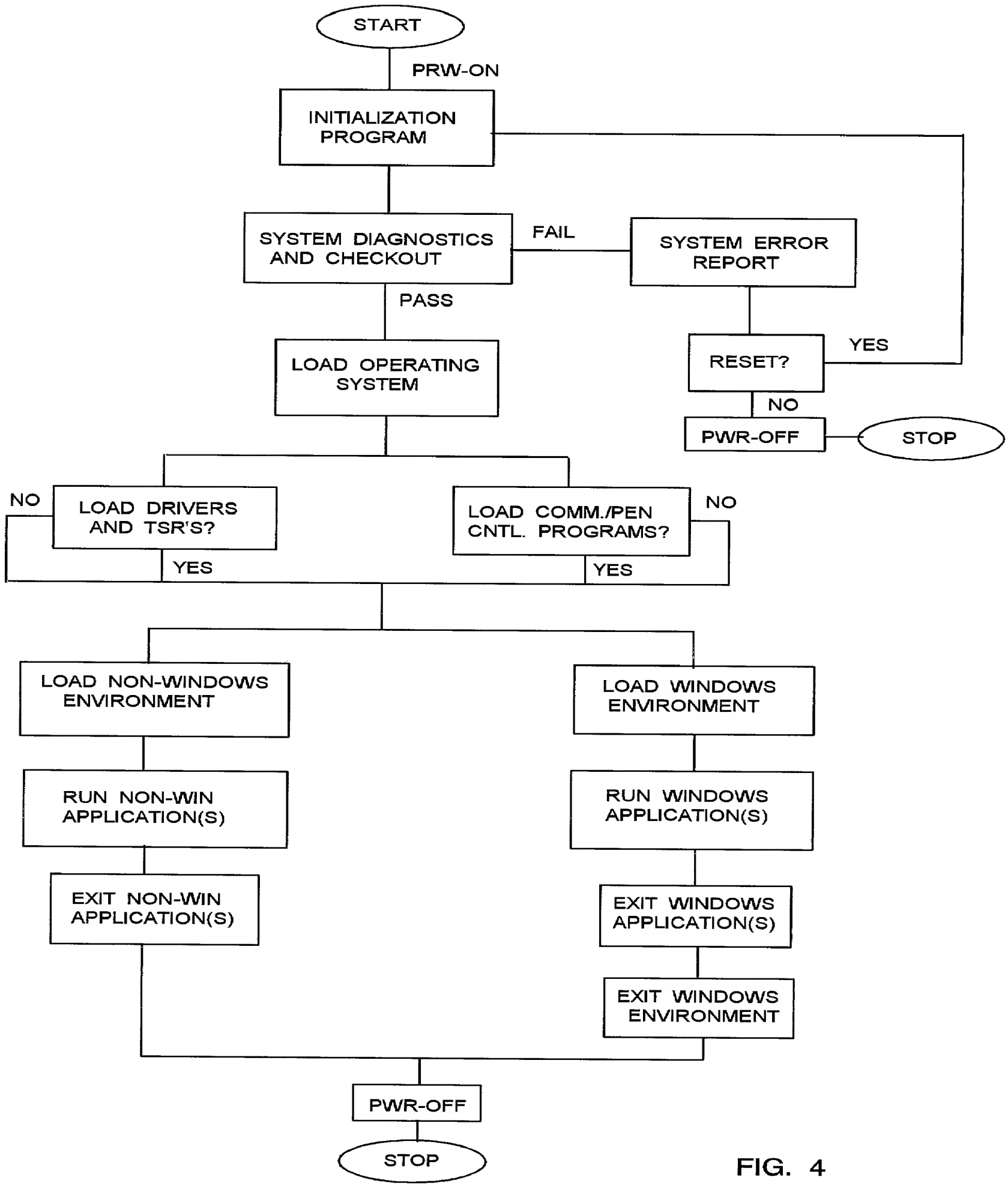
START
PRW-ON
INITIALIZATION PROGRAM
SYSTEM DIAGNOSTICS AND CHECKOUT
FAIL
SYSTEM ERROR REPORT
PASS
LOAD OPERATING SYSTEM
RESET?
YES
NO
PWR-OFF
STOP
NO
LOAD DRIVERS AND TSR'S?
YES
LOAD COMM./PEN CNTL. PROGRAMS?
NO
YES
LOAD NON-WINDOWS ENVIRONMENT
LOAD WINDOWS ENVIRONMENT
RUN NON-WIN APPLICATION(S)
RUN WINDOWS APPLICATION(S)
EXIT NON-WIN APPLICATION(S)
EXIT WINDOWS APPLICATION(S)
EXIT WINDOWS ENVIRONMENT
PWR-OFF
STOP

FIG. 4

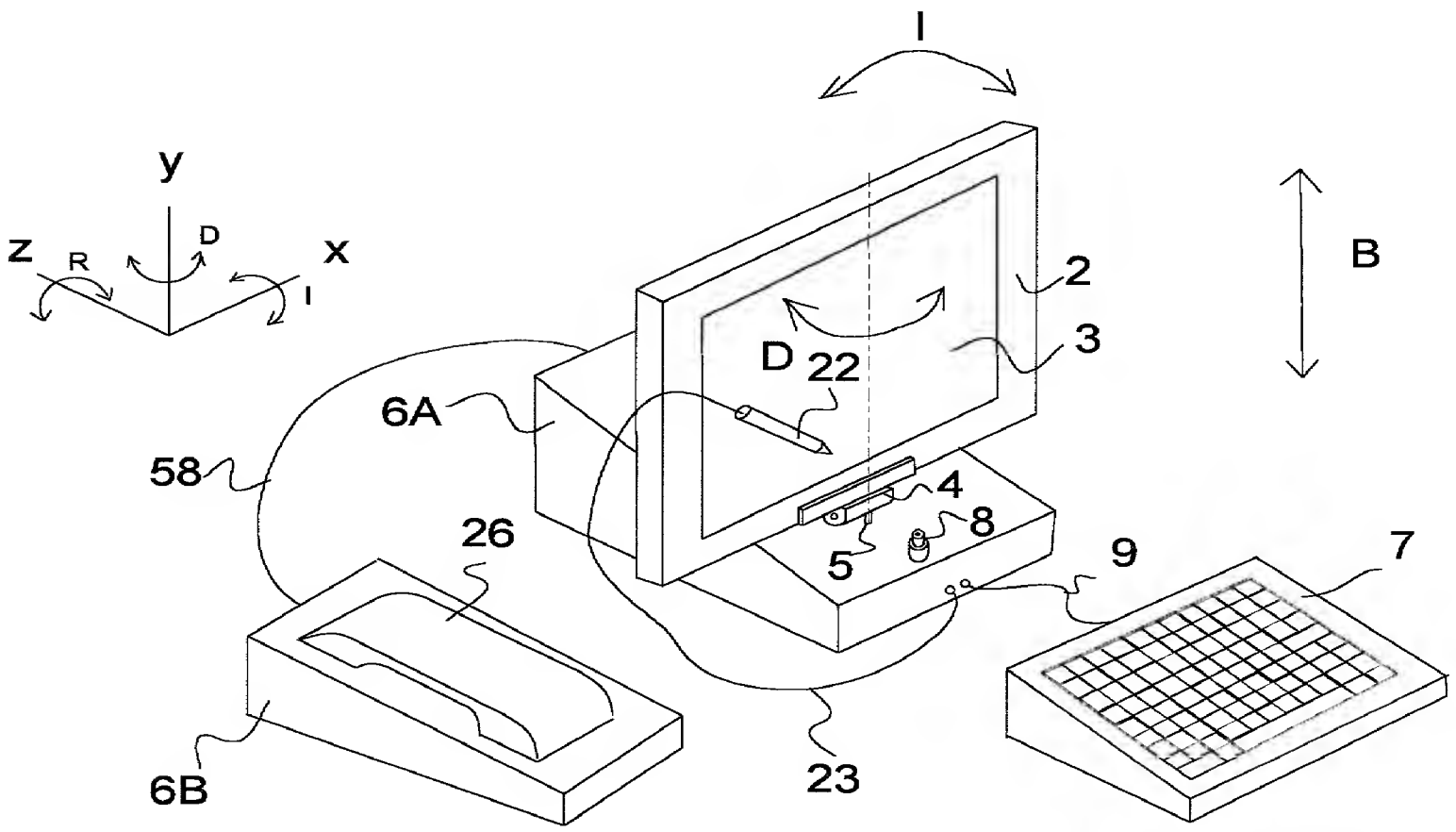

FIGURE 5

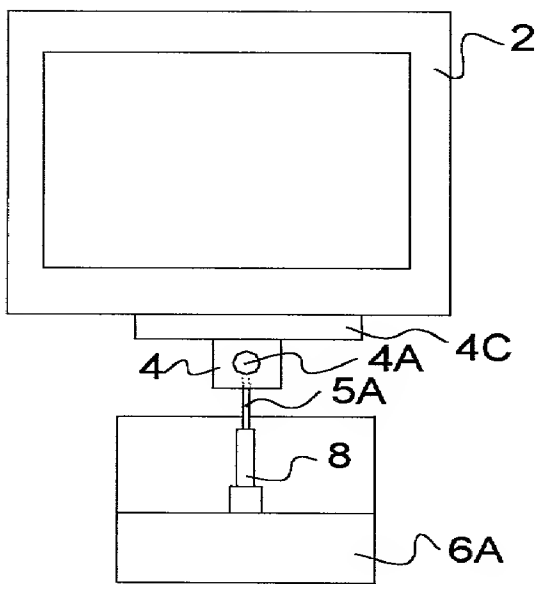

FIG. 6A

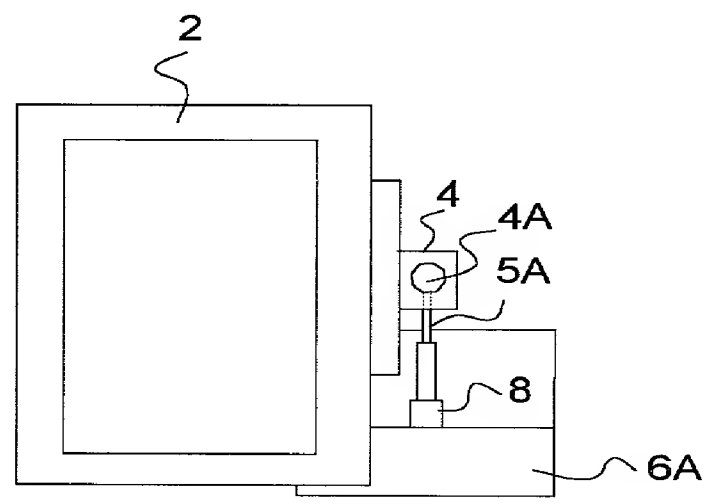

FIG. 6B